Gun Cleaning Clinic: Knowing the Limits of Rust Preventatives

By: Steve Schmidt

What's Best?
Quite often, I'm asked to recommend the best rust preventive for firearms applications. I know this sounds like a fundamental request, but providing a good, comprehensive answer is not as simple as it seems. More often than not, my initial response ends up being a lot of additional questions like:

- How long will the gun be in storage?
- What type of environmental exposure will it encounter?
- How frequently will it be handled with bare hands? And…well, so on and so forth.

Modern rust preventives are similar to today's hi-tech, chemical gun solvents - no single product is perfect (or best) for all conditions, all the time. If you do a lot of shooting and cleaning, I'm sure you'll agree not all solvents are created equal. Some stomp out powder and carbon fouling with more authority than others, a few work particularly well on lead and copper – still others perform almost magically when it comes time to strip out stubborn wad fouling from a smoothbore.

Likewise, rust preventives are tailored to meet or exceed specific criteria established by the individual manufacturer. A good majority of them are multi-purpose formulas designed to lubricate and/or clean and condition in addition to fighting rust. Products with large percentages of lubricating and cleaning additives may or may not perform to your required level of corrosion protection.

On the other hand, products providing maximum corrosion-resistance may be too messy or difficult to remove for daily use. Understanding these properties is a must in order to select products that meet or exceed your particular application.

To help put things into perspective, let's compare two, very real scenarios. Nowadays, it's not uncommon for large stores, such Scheels and Cabela's, to practice a "help yourself" or "browse at will" policy that permits customers to "pick-up and fondle", leaving behind the remnants of sweaty, acidic fingerprints on every gun they touch. I'd like to believe most shops wipe down their inventory on occasion, but to assume this happens on a daily basis teeters on absurd. Obviously, this situation requires at least a medium-duty, rust preventive that guards against rust caused by daily handling for a full workweek or so. On the contrary, an antique arms collector, who keeps his priceless heirlooms in a humidity-controlled gun safe, and handles them only once or twice a year, can probably get by with something less protective, less messy, maybe even less expensive.

Developing A Test
Brainstorming for this months' **Cleaning Clinic** generated some interesting thoughts, opinions and speculation from some of our techs and other crew here at Brownells. Summed up, there appears to be an enigma surrounding the performance of different types of rust preventives. What works well for some shooters, could very well fall short for others. So, I felt the best way to assist you with product selection was to try and show the limitations of some of the more common products by subjecting them to a simple 72-hour, environmental test. Since I probably have more in common with Dr. Frankenstein than an Ivy League science graduate, I knew the toughest job would be keeping the test realistic, achieving some identifiable results, and not going too overboard with it. This is what I came up with.

I began by selecting ten products commonly used to protect firearms from rust and corrosion. These were: **Birchwood Casey Sheath, Boeshield T-9, Break-Free LP, Break-Free Weapon Wipes, Brownells Cosmoline, Brownells Rust Preventive No. 2, Hoppe's Lubricating Oil, Rig Universal Grease,** and **Tetra Gun Lubricant**. To curb my own curiosity, I also threw in a couple extra lubricants – Valvoline 5W-30 motor oil and the universally recognized WD-40.

The test-bed would consist of 1/8" thick, raw, flat steel plate cut into individual pieces measuring about 5" to 6" long x 1¾" wide. In order to achieve accurate results, each test-bed would need to be as consistent as possible, so I bead blasted the plates to a uniform surface texture. This process removed any pre-existing corrosion and exposed a fresh, unadulterated test surface so every sample would start on the same playing field. Bead blasting also produced millions of microscopic pockets in the metal that would help capture moisture and accelerate rust formation on what would otherwise be a smooth, polished finish.

Starting with the letter "A," I then hand stamped each plate with an identification letter to prevent mix-up during the three day testing process. Plate "A" would be the designated CONTROL plate, left untreated to weather the storm without the protection of any rust preventive whatsoever.

Applying The Test Samples

After designing and printing-out a datasheet, it was time to get down to business and kick-off the study. I wrote "CONTROL" next to the letter "A" on the datasheet and moved the plate stamped "A" temporarily off to the side; then, proceeded to record the name of each product next to one of the remaining letters ("B" through "L") on the datasheet. I made sure to check the datasheet twice just to be sure everything was correct.

Since it's not unusual to use rust preventives on a daily basis, especially if you shoot a lot or carry a concealed weapon, I do consider ease of application and odor to be important factors in the selection process. Therefore, I established a crude, four-level scale for rating sample thickness (or weight). These were: ultra-thin, thin, thick and heavy. Odor would be rated on a numerical scale of 1 to 5, one being no detectable odor and five being knock-your-socks-off, wife-kicks-you-out-of-the-house stinky!

To avoid contamination factors, each test plate was thoroughly degreased with its own, clean rag saturated with Brownells TCE Cleaner Degreaser, then allowed to dry completely prior to applying the rust preventives.

Each sample, with the exception of Break-Free Weapon Wipes, was applied to its respective test plate with a fresh, cotton bore patch to prevent cross-contamination. Weapon Wipes are pre-saturated cloths ready for use, so transferring the product to a patch was not necessary. Since the fluid consistency of the samples varied, I applied them with the mindset that I was protecting a firearm for six months of indoor storage, be it a cabinet or humidity-controlled gun safe. This meant one, even, easy to apply layer on the front face and edges of the plate – no puddling or extra thick coverage was allowed.

Let The Testing Begin
All test plates were positioned flat, sample side up and spaced approximately 2" apart on an unprotected picnic table in my backyard for three days. If you're at all familiar with weather in the Midwest, you know it's not uncommon to experience two or three seasons of weather in a single weekend -– this particular 72-hour period was no exception. We had high humidity, scorching heat, followed by some horrific thunderstorms that produced pounding rains and cool evening temperatures – perfect conditions to grow some serious rust and corrosion on raw steel!

The test plates were inspected at around 24 hours into the study with negligible results, but by day three, things had shaped up nicely.

The Results
After 72 hours of exposure, all test plates were brought indoors for evaluation and photographing. You will notice there are two photographs per plate. The first photograph shows the plate immediately after testing. The second depicts the same plate after degreasing with TCE to remove all loose corrosion. It provides the more accurate representation of overall protection. Note that raw steel is especially susceptible to corrosion and is not a true indication of how blued, parkerized, plated or painted gunmetal will react to different environmental conditions.

Plate A - CONTROL

The control plate was degreased and left unprotected for the duration of testing. As a result, it exhibits the heaviest amount of rust and pitting, covering nearly 100% of the surface area.

Plate B - BIRCHWOOD CASEY SHEATH
Brownells P/N: #167-016-400 (4.5 oz. can)
Thickness: Ultra-thin liquid
Odor Rating: 4 (moderate to strong)

Sheath Rust Preventive is a unique, oil-based formula featuring a special FPR (finger print remover) agent. Its ultra-thin consistency applies easily with a soft cloth and creeps into hidden crevices for thorough coverage. Excellent choice for general wipe down and long term, indoor storage of firearms. Suitable for daily protection in the field, especially in humid and salt-air climates. Factory recommended as a bore cleaner as well. Available in 4.5 oz. and 1 gal. containers, 2 oz. and 6 oz. spray aerosol cans.

Test plate examination shows the water displacing properties of Sheath. Mild pitting and staining is evident; overall metal condition remains good.

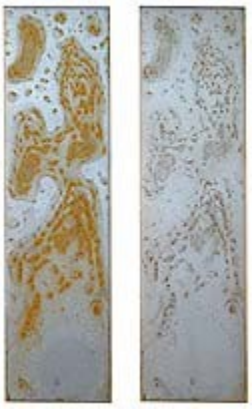


Plate C - BOESHIELD T-9

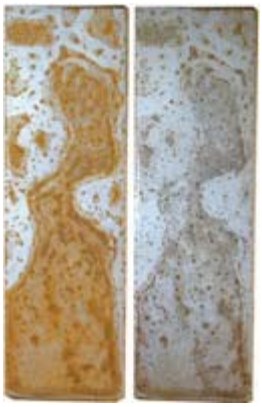
Brownells P/N: #686-900-004 (12 oz. aerosol)
Thickness: Ultra-thin liquid
Odor Rating: 3 (moderate)

Boeshield T-9 is a heavy-duty, rust and corrosion preventive developed by The Boeing Company for lubrication and protection of aircraft components. Specially formulated combination of solvents, waxes and lubricants coats and protects smooth and porous metals from rust and corrosion. Displaces moisture and lubricates at the same time. Dries to a thin, waxy film that will not harm paints, plastics and vinyls. Not easily removed once dried; requires mineral spirits or degreaser. For firearms applications requiring better than average protection against moisture indoors and outdoors. Good choice for long-term exposure to salt-air environments, areas with high humidity or extreme wetness. Available in 4 oz. and 1 gal. containers, 4 oz. and 12 oz. spray aerosol cans.

Test plates reveal minimal moisture penetration and negligible rust formation. Collection of some dust/debris on surface is present. Minor blemishes present after degreasing. Overall metal condition is excellent.

Plate D - BREAK-FREE LP
Brownells P/N: #102-000-001
Thickness: Thick liquid
Odor Rating: 2 (minimal)

Contains polymerized, synthetic oils for excellent lubrication at high temperatures and pressures, plus built-in preservatives to help guard against rust and corrosion. Reduces wear and resists thermal breakdown. Good, dual purpose, lubricant/preservative for the internal workings of semi-auto weapons that receive routine cleaning and maintenance.



Test plate shows moderate rust formation and shallow pitting.

Plate E - BREAK-FREE WEAPON WIPES
Brownells P/N: #102-000-006
Thickness: Ultra-thin liquid
Odor Rating: 4 (moderate to strong)

Weapon Wipes are soft, non-woven cloths pre-saturated with Break-Free CLP, a Mil-Spec oil with cleaning, lubricating and protecting properties. Convenient to use; offers good indoor and outdoor protection against rust when used regularly. Easy to apply and remove.

Test plate shows moderate rust formation, less pitting than Break-Free LP.

Plate F - BROWNELLS COSMOLINE
Brownells P/N: #083-033-016 (1 lb.)
Thickness: Heavy grease
Odor Rating: 2 (minimal)

Heavy weight grease specifically designed for maximum protection against rust and corrosion on all types of metal. Rated to protect polished steel panels from rust for one year in Open Shed Storage and 30 days, minimum, in a humidity cabinet. Thick grease consistency requires more effort to apply and remove. Apply with brush or rag at room temperature or melt in a double boiler for use as a dip treatment. Excellent choice for long-term storage in all environments, especially during shipping. Remove with chlorinated solvents like TCE. Available in 1 and 4 lb. containers.

First test plate shows collection of dust/debris on treated surface but no moisture penetration or rust formation. Slight darkening of the steel was apparent after degreasing. Overall metal condition is excellent.

Plate G - BROWNELLS RP2
Brownells P/N: #083-019-016 (1 pint)
Thickness: Ultra-thin liquid
Odor Rating: 4 (moderate to strong)

Special blend of petroleum distillates neutralizes fingerprints, displaces moisture and helps protect against rust and corrosion. Ultra thin consistency creeps into hard-to-reach areas for complete coverage. Suitable for all day field protection and long-term, indoor storage of firearms. Excellent choice for general wipe-down of all metals. Will not harm stock finishes. Available in 1 pt., 1 qt. and 1 gal. containers.

Test plates show the water displacing properties of RP2. Minimal rust formation and pitting is evident.

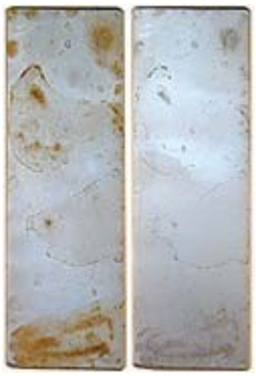


Plate H - HOPPE'S LUBRICATING OIL
Brownells P/N: #699-100-003
Thickness: Thin liquid
Odor Rating: 1 (odorless)

Lightweight, high viscosity, general purpose oil safe for all metals and woodwork. Lubricates moving parts while protecting them from rust and corrosion. Specially formulated to resist gumming and hardening; will not become rancid. Highly purified and odorless, so it's a pleasure to work with and safe for stock finishes. Applies and removes easily. Excellent, wipe-down and bore protecting oil for firearms stored indoors. Provides good protection in the field if re-applied daily.

Test plate shows significant rust formation and disruption of the bead-blast finish over the majority of the surface area. Obvious discoloration and mild pitting is present after degreasing.

Plate I - RIG UNIVERSAL GREASE
Brownells P/N: #756-010-001 (1 oz. jar)
Thickness: Heavy grease
Odor Rating: 1 (odorless)

Clean, viscous grease designed specifically for heavy-duty rust prevention. Applies with a clean shop cloth or cotton swap. Wipe off all excess to leave a thin, protective film that fights rust indoors and out. Leave the application thicker for excellent protection in salt-air or extremely wet or humid conditions. Not easily removed, use degreaser. Available in 1 oz., 3.75 oz. and 15 oz containers.

Test plate on left shows the typical collection of dust/debris common with grease-based rust preventives. No evidence of rust formation or discoloration. The degreased plate shows the metal is unmarked.

Plate J - TETRA GUN LUBRICANT
Brownells P/N: #316-006-001 (1 oz. bottle)
Thickness: Thick liquid
Odor Rating: 3 (moderate)

Fluoropolymer penetrating lubricant and conditioner designed to reduce friction/wear and fight corrosion. Thick, tacky consistency adheres well to all metal surfaces. Wipe off excess for a good, protective coating indoors and while in the field. Displaces water well. May discolor painted surfaces. Available in 1 oz., 4 oz. and 8 oz. squeeze bottles.

Test plates show uniform water displacement and generally good protection overall. Mild pitting is present.

Plate K - VALVOLINE 5W-30 MOTOR OIL
Brownells P/N: N/A
Thickness: Thick Liquid
Odor Rating: 2 (minimal)

#1 choice of top mechanics, but not recommended for firearms applications. In a pinch, new motor oil of any type/brand will offer decent protection against rust until the firearm can be thoroughly cleaned and lubricated. In emergency situations, I've used both motor oil and kerosene as rust preventives on exterior gunmetal without incident. However, avoid contact with stock finishes and optics.

Test plates show some water displacement value in motor oil. Pitting is present, but the metal is in better condition than CONTROL Plate A.

Plate L - WD-40

Brownells P/N: N/A
Thickness: Ultra-thin liquid
Odor Rating: 4 (moderate to strong)

WD-40 lubricates, cleans and displaces moisture to prevent rust. Manufacturer recommended for firearms and other sporting equipment. Easy to apply formula contains petroleum distillates that could affect certain stock finishes. May cause gumming on internal components and inside receivers. Long-term use on gunmetals has been thought to limit the effectiveness of certain bluing solutions. WD-40 has been around a long time and earned the reputation as an excellent rust preventive for exterior surfaces of firearms. A favorite among old timers.

Test plates show excellent moisture displacement. Minimal rust formation is present; almost no pitting is visible after degreasing.

Pick What's Right For Your Needs

As shown, the properties and limitations of different rust preventives vary dramatically. This allows gun owners to select products that best fit their maintenance style and demands, whether indoors or out in the field. Obviously, storage in a dehumidified gun safe does not present the same challenges as a pack hunt for black tail along the Pacific Coast. Keep this in mind when selecting the best rust preventive for your application. And, be open to switching between products as your firearms change environments.